

BROWNSON (J. J.)

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DUBUQUE, IOWA.

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CHEST DRAINAGE IN EMPYEMA.*

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Mr. President and Gentlemen of the Tri-State Medical Society:—

WHEN I was invited by the officers of your Association to read a paper at its meeting in Chicago, I felt at a loss to know just what subject to select; but remembering an incident that happened when I was quite a young practitioner, it led me to present the subject which I have the honor to talk to you about to-day.

It was many years ago when one day my dear friend and preceptor, the late Dr. G. M. Staples, asked me to go and give chloroform for him in a certain case. The doctor told me that the patient had had some chest trouble, and that he wished to make a thorough examination. When we arrived at the house we found a man about thirty years of age, large and stout looking, had cough, breathing slightly accelerated. During the afternoons he complained of feeling chilly, followed by slight fever and sweating. I noticed a peculiar color of the skin, not unlike what we would call a "bilious look."

By request of the physician I made an examination of his chest, but there was nothing that I could find out of the ordinary. Imagine my surprise when the doctor said: "Give him a little chloroform, I think I will put in a tube," and in a few minutes later to see the pus rolling out of the thoracic cavity. He then showed me the extent of the dullness and cedema, and also pointed to the right side of the sternum where the heart

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beat was located, owing to its displacement by the left-sided effusion. Of course, I then became an enthusiast on empyema, and have been so ever since.

It chanced that I had on hand at this time a little boy who had been sick for about four weeks, and although he complained of nothing but fever and "pain in his stomach," medicine seemed to have no effect on him. After seeing the previously mentioned case, it dawned upon me that he might have an effusion in the chest, so I hastened to the house to make an examination, and there, sure enough, was the dullness, œdema and slight bulging on the left side. Summoning one of my young medical friends, who, on his arrival, administered an anæsthetic, I introduced the needle of the aspirator, and sure enough pus was found; the needle was withdrawn and a tube put in the chest, and about a pint of pus drained away. This was my first operation for empyema, and in due form our little patient made a good recovery.

Since that time, in a moderate surgical and consultation practice, I have seen quite a number of cases of effusion in the chest, and to some of the points picked up in the recognition and treatment of this condition, I will, with your permission, direct your attention.

It would be needless to take up your time in dwelling upon the history of empyema, which dates from the time of Hippocrates, or to discuss its various causes so familiar to you all; but rather to proceed at once to consider the methods of determining in chest disease whether the cavity of the thorax contains fluid. Is this fluid pus? If so, what is the easiest and best means for its successful treatment?

The history of the case may serve to start us on the right track, as we would expect to find such a condition following an acute affection of the chest; but even here there are so many diseases whose course and clinical pictures are so similar that, in many cases, even the most expert are sometimes baffled.

The various phases in pneumonia, pleurisy, pneumothorax, pericarditis, exhibit such like conditions, and where pus exists with pneumothorax as in pyopneumothorax, I know of no condition where the perplexities are so great and where so much care and study is required to make a diagnosis.

As to symptoms, the most trustworthy in my experience is where hectic phenomena follow an acute affection of the chest, a continuous accelerated pulse, breathing rapid and restricted; temperature ranges from 100° to 102°. The patient, as it were, does not seem to get well, and medicines do not make any impression or give relief. If seen in consultation, the doctor will almost always say: "The patient's system does not respond to treatment." Such a case in the hands of the average practitioner will almost always be a surgical one.

After all, our main reliance must be on the physical signs, for by this means we must satisfy ourselves that an effusion exists before we can undertake mechanical means to relieve it. Here again we will find many puzzling problems to solve. In a case following the history and symptoms previously given, we find, on inspection of the chest, a bulging on one side, extreme dullness ("wooden chest"); the side does not expand like the sound one; there may be bulging between the ribs. This, in my experience, is rare. By succussion, if the effusion be fluid, it may be heard in the pleural cavity. One of my friends puts much stress on mensuration, but I

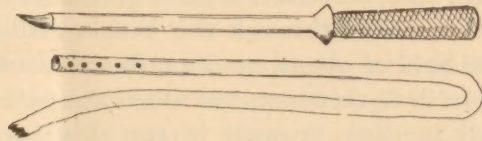


FIG. I. Trocar and Canula. Rubber Tube.

must confess that I have not used it much. It must not be forgotten that one will often drop onto the fact that an effusion exists on the left side by finding the heart displaced to the right of the sternum.

The signs in which I place the most reliance, however, in addition to dullness and immobility of the affected side, are *œdema* and *tenderness*. Given a case with the foregoing history, symptoms and physical signs, we proceed to clear up the diagnosis by exploratory aspiration with a sterilized needle. The character of the effusion, if any, will then be determined; if it is pus, a tube should be put in at once and thorough drainage of the pleural cavity maintained.



FIG. II. Inserting Tube Through Canula.

What is the easiest, and at the same time, safest method of successful chest drainage? I must say that siphon drainage in my hands has given none but the best results. It is easy of performance. It drains slowly and thoroughly from the bottom of the pleural cavity. The simple method by which irrigation of the chest can be done, if necessary, the length of the tube precluding any danger of its retracting into the chest—all tend to commend this method for general adoption, rather than the more difficult and complicated processes often recommended.

I prefer to enter the chest at the point of the most dullness, and over the site of the œdema and the greatest tenderness on pressure, although, of course, the location of the liver on the right side and the heart on the left side must be borne in mind. In the two cases of spontaneous rupture outside of purulent effusion which I have seen, both were at the sixth interspace just forward of the axillary line. In general terms I should say that the above principles should govern, care being taken not to go below the eighth rib on the right side, or the ninth on the left side, unless there should be some special indication.

The mode of procedure is as follows: A trocar, with a canula of about one-sixth to one-fourth inch diameter; a piece of rubber tubing about two feet long of a size that passes through the canula easily, are needed; the instruments, tube and field of operation are now sterilized. It is generally best to give chloroform in these cases, and when the patient is sufficiently anæsthetized a small incision is made in the skin over the intercostal space. The trocar and canula is then pushed in. It is best to enter the

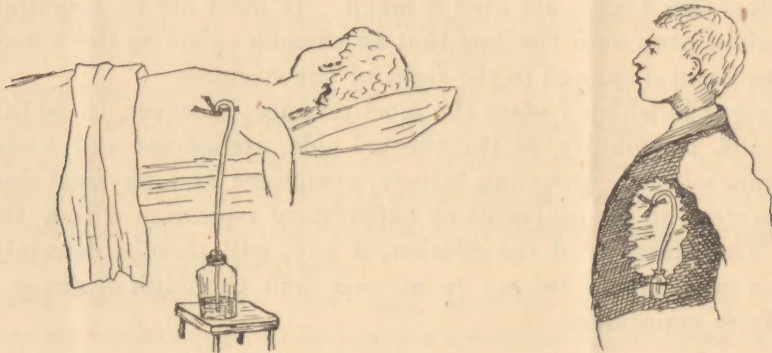


FIG. III. Siphon Tube in Situ. FIG. IV. Tube Shortened, Receptacle carried in Vest Pocket.

point of the instrument a little upward at first, then downward over the top of the lower rib. If this is done, and the flat side of the trocar directed upward there will be very little danger of wounding the intercostal artery which runs along the lower border of the rib. The trocar is then removed and the tubing passed through the canula to the bottom of the pleural cavity; the flow of pus can now be regulated through the tube at pleasure. It is best to put the end of the tube in a bottle of carbolyzed water and let the matter siphon out; of course, if the patient should feel faint or any untoward symptoms appear, the flow may be stopped for a while. I have never seen any emergency in letting the pus drain at once. Several strips of adhesive plaster are now placed around the tube and fastened to the chest, a gauze dressing put on, and the patient allowed to rest comfortably in bed.

It will not be necessary to irrigate the cavity unless the tube gets clogged or the temperature should rise. If it is found proper to do this, a

small hard rubber syringe is used to exhaust the air from the tube and the end is placed in the irrigating fluid. By raising the vessel the antiseptic runs in, and all that is necessary to do is to lower it and the fluid runs out. By this method we introduce no air, and we can see at a glance whether all the irrigating fluid comes away.

As the case progresses and the patient becomes convalescent he may be allowed to get up and go around. The tube may be shortened and placed in a small bottle, which he may carry in his pocket. The tube must be left in as long as the discharge is purulent, and should be pulled out a short distance occasionally, as healing takes place from the bottom. In this way the operator, by previous measurement, knows just how much tube is in the chest.

We can always tell whether things are doing well or not by the range of temperature, for "as soon as drainage is made, the temperature falls." If anything interferes with thorough drainage, the "temperature will rise." This is the most important of all surgical axioms and is the principle upon which rests the foundation of the whole of surgical science.

To further illustrate the practical working of siphon drainage in empyema, allow me to present a few clinical examples:

CASE I. Roy G., aged 6 years; taken with pain in the chest, fever, cough. The usual remedies were ordered; he improved somewhat, but at the end of two weeks resolution did not take place, but he commenced to have hectic symptoms. Physical examination developed dullness and marked bulging on the left side; there was œdema, and the point of most tenderness was over the sixth interspace in the axillary line. Aspiration at this point showed pus. The skin was incised and siphon drainage used, and about a pint of matter drained away. The temperature dropped to normal and at the end of two weeks the tube was shortened, and he was allowed to attend a picnic some miles distant. About the ninth week the tube was removed and he has since been well.

CASE II. C. K., aged 40 years; first sick with chills and pain in the left side; had fever and cough, and after several days the breathing became very much embarrassed. The heart was found displaced to the right of the sternum, and dullness and œdema were present. Aspiration was performed on the left side in the seventh interspace, from which pus exuded. Siphon drainage was then made, and the matter allowed to drain away. Patient made a good recovery, and the tube was removed in two months.

CASE III. W. S., aged 4 years; had measles. In the usual time the rash disappeared, but the cough persisted, and the dyspnoea became so great that he could not lie down. Physical examination of the chest revealed dullness and bulging of the whole right side. Chloroform was given; aspiration withdrew pus; siphon drainage was made and the effusion allowed to drain away. This gave him immediate relief, and in less

than a week he was around the house with the tube in a bottle and he passed on to a good recovery.

CASE IV. G. H., aged 9 years. Attack commenced with symptoms of pleuro-pneumonia, the patient continued to get worse from time to time. Nine weeks after she was taken sick dullness developed over the right side and she had a dry and incessant cough, which annoyed her every minute. Dyspnœa was well marked, and there was considerable œdema and tenderness over the whole area. A diagnosis of empyema was made, which subsequent aspiration confirmed. Siphon drainage was then done. Everything went well until the end of the first week, when, while washing out the cavity, the child took a fainting and coughing spell, from which she was with difficulty revived. The irrigation was then stopped, and with this exception she did well. The tube was removed in nineteen weeks.

CASE V. J. S., resident of Earlville, Iowa, 22 years of age, presented himself with a history of having had two months previously an attack of la grippe. He did not recover from this, but developed hectic symptoms and sustained a considerable loss of weight. He had a cough with profuse purulent expectoration and a diagnosis of tuberculosis had been made by two physicians. On physical examination there was found dullness, œdema and marked tenderness on the right side. These appearances, together with the peculiar coppery or bilious color of the skin, led to a determination of empyema with rupture into the bronchi. Subsequent aspiration confirmed this opinion, and incision in the seventh interspace on the right side was made and siphon drainage put in. The young man was very much relieved by this procedure and eventually recovered.

CASE VI. P. S., age 9 years. Sickness began with fever, cough and rapid breathing. His appetite remained good, but the pulse and breathing increased. Physical signs showed resonance on both sides, except that there was slight bulging on the right side; there was no evidence indicating effusion. Aspiration was, however, performed in the seventh interspace on the right side, but showed nothing but blood. The symptoms continued to get worse, when, after he had been sick about nine weeks, a small spot of dullness, with œdema and extreme tenderness, developed in the interspace just below the left scapula. Aspiration at this point found pus, and the drainage tube was now put in. About four ounces of matter drained away. The tube was left in about a week, when there having been no discharge since the first day, and the symptoms having abated, it was thought best to remove it. The little boy made an uneventful recovery and is now thoroughly well.

In the previously cited cases I have endeavored to give only an example of those which present different phases. I now wish to give an illustration of how nature attempts to cure empyema by spontaneous opening externally:

CASE VII. L. P., aged 29 years, took sick in the country with chest symptoms, lung fever being diagnosed by his physician. He continued very ill for about four weeks when pus broke out in two places on the right side of the thorax. Following this he made a slow recovery, but the discharge did not stop, and for this condition he came to the city some six months later. There were two sinuses in the sixth interspace on the right side, which led into the chest. Drainage was made in the seventh space, the tube passing to the bottom of the pleural cavity. The sinuses promptly closed and at the end of four weeks the tube was removed and he has since been well.

CASE VIII. A. G., aged 60 years. Had pleurisy six months previously; has had cough and purulent expectoration. About three months ago a small sinus appeared over the sixth rib, and on introduction of a probe necrosed bone was felt. A diagnosis of necrosis of the rib was made and exsection of same advised. At the operation the necrosed rib was removed, and underneath it was a thickened condition of the pleura, with a large pocket of pus. This was certainly nothing more than an old empyema, and in its attempt at evacuation caused necrosis of the rib. Thorough drainage of the cavity was made and the man went on to a good recovery.

I might go on and give descriptions of numerous cases, but my paper has now already taken up too much space, and I merely wish to say in conclusion that I believe many valuable lives are lost by a failure to recognize and properly treat this disease. If I have succeeded in calling attention to the fact that when a physician has a case of persistent symptoms following an acute affection of the chest, together with the signs of dullness, cedema and tenderness, he should not hesitate to use an aspirator to clear up the diagnosis, and if you will only overlook any little omissions or irregularities in this paper, for I have written it off-hand so as to bring you all near the bed side, I shall feel amply repaid and truly thankful for the courtesies extended in allowing me to present one of the most interesting and life-saving operations in the whole domain of surgery.

